

## Claims

1. A wireless network control system, comprising:  
a plurality of base stations that communicate with a mobile terminal;

and relay stations provided in association with the respective base stations to relay communication between the mobile terminal and the base station;

wherein when more than one of the plurality of base stations detect the mobile terminal within each accommodation areas, one of the base stations which detected the mobile station establishes communication connection to the relay station associated with another base station which detected the mobile station, and then performs diversity combining of radio signals from the mobile terminal received through the relay station associated with said one of the base stations and the relay station associated with said another base station.

2. The wireless network control system according to claim 1, comprising:

a wireless network control apparatus that controls communication between the base stations and the mobile terminal;

wherein the wireless network control apparatus comprises,

a management table that stores information on relay



station which can be communicatively connected to the base station, in relation to the respective base stations;

search means that, when more than one of the plurality of the base stations detect the mobile terminal, searches a base station which can be communicatively connected to relay stations associated with the base stations which detected the mobile terminal, from the base stations which detected the mobile terminal, based on the management table;

and control means that allows communication connection to be established between the base station searched by the search means and the respective relay stations;

wherein the base station comprises combining means that performs diversity combining of radio signals from the mobile terminal received through the respective relay stations.

3. The wireless network control system according to claim 2 wherein:

when a mobile terminal is detected based on information indicating radio field intensity received from the mobile terminal, the search means searches a base station that can be communicatively connected to relay stations that have relayed the information indicating the radio field intensity.

4. The wireless network control system according to claim 2 wherein:

the control means of the wireless network control apparatus disconnects communicative connection between base



station other than the base station searched by the search means and the relay station.

5. The wireless network control system according to claim 2 wherein:

the base station comprises relay-station-information transmission means that transmits information indicating relay stations to which the base station can be communicatively connected to the wireless network control apparatus;

and the wireless network control apparatus comprises management-table update means that updates the management table based on the information indicating the communicatively connectable relay stations transmitted from the base station.

6. The wireless network control system according to claim 1 wherein:

said base station comprises,

inter-base station communication means for communicating with said another base station;

a management table that stores information on relay station which can be communicatively connected to said base station;

determination means that, when the mobile terminal is detected, determines whether said another base station in communication with the same mobile terminal exist or not based on information from said another base station obtained by communication using the inter-base station communication



means;

search means that, when said another base station in communication with the same mobile terminal detected by said base station is determined to exist, searches a base station which can be communicatively connected to a relay station associated with said base station and relay station associated with said another base station which communicate with the same mobile terminal based on the management table;

control means that communicates a control signal through the inter-base station communication means such that communication connection is established between the base station searched by the search means and the respective relay stations;

and combining means that performs diversity combining of radio signals from the mobile terminal received through a plurality of relay stations.

7. The wireless network control system according to claim 6 wherein:

when a mobile terminal is detected based on the information indicating the radio field intensity received from the mobile terminal, the determination means determines whether said another base station that receive the information indicating the radio field intensity of the same mobile terminal exist or not,

and the search means searches a base station that can



be communicatively connected to relay station that have relayed the information indicating the radio field intensity.

8. The wireless network control system according to claim 6 wherein:

the control means of said base station communicates the control signal through the inter-base station communication means such that the communication connection between a base station other than the base station searched by the search means and the respective relay stations is disconnected.

9. The wireless network control system according to claim 6 wherein:

said base station transmits information on communication connection with a mobile terminal within an accommodation cell to said another base station through the inter-base station communication means.

10. A wireless network control apparatus that controls a radio access network having a plurality of base stations which communicate with a mobile terminal, and relay stations provided in association with the respective base stations to relay communication between the mobile terminal and the base stations, comprising:

a management table that stores information on relay stations which can be communicatively connected to the base station, in relation to the respective base stations;

search means that, when more than one of the plurality



of base stations detect a mobile terminal, searches a base station that can be communicatively connected to the relay stations associated with the base stations that detected the mobile terminal from the plurality of base stations based on the management table;

and control means that, in order to allow the base station searched by the search means to perform diversity combining of radio signals from the mobile terminal, the signals being relayed by the relay stations associated with the base stations which detected the mobile terminal respectively, establishes communication connection between the base station and the respective relay stations, and allows the radio signals to be transmitted from the respective relay stations to the base station.

11. A base station that can communicate with a mobile terminal through a relay station, comprising:

inter-base station communication means for communicating with another base station;

a management table that stores information on a relay station associated with said base station, and relay station which is associated with said another base station and can be communicatively connected to said base station;

determination means that, when a mobile terminal is detected, determines whether said another base station in communication with the same mobile terminal exist or not based



on information from said another base station obtained by communication using the inter-base station communication means;

search means that, when said another base station in communication with the same mobile terminal detected by said base station is determined to exist, searches a base station that can be communicatively connected to the relay station associated with said base station and the relay station associated with said another base station based on the management table;

control means that communicates a control signal through the inter-base station communication means such that communication connection is established between the base station searched by the search means and the respective relay stations;

and combining means that performs diversity combining of radio signals from the mobile terminal received through said respective relay stations.

12. A wireless network control method that controls a radio access network having a plurality of base stations which communicate with a mobile terminal, and relay stations provided in association with the respective base stations to relay communication between the mobile terminal and the base station, comprising:

a mobile-terminal detection step where the base stations



detect the mobile terminal;

a step where, when more than one of the plurality of base stations detect a mobile terminal within each accommodation area, one of the base stations which detected the mobile station establishes communication connection to the relay station associated with another base station which detected the mobile terminal;

and a combining step where said one of the base stations performs diversity combining of radio signals from the mobile terminal, the signals being received through relay station associated with said one of the base stations and the relay station associated with said another base station.

13. A wireless network control method that controls a radio access network having a plurality of base stations which communicate with a mobile terminal, and relay stations provided in association with the respective base stations to relay communication between the mobile terminal and the base station, comprising:

a mobile-terminal detection step where a wireless network control apparatus detects the mobile terminal,

a search step where, when more than one of the plurality of base stations detect the mobile terminal in the mobile-terminal detection step, one of the base stations which detected the mobile terminal is searched from the base stations which detected the mobile station based on a management table,



wherein searched based station can be communicatively connected to relay station associated with the base stations which detected the mobile station, wherein the management table stores information on relay stations which can be communicatively connected to the respective base stations in relation to the respective base stations;

and a control step where, in order to allow said one of the base stations searched by the search means to perform diversity combining of radio signals from the mobile terminal, the signals being relayed through the relay stations associated with the base stations which detected the mobile station respectively, and to perform communication connection between said one of the base stations and the respective relay stations is established, and the radio signals are allowed to be transmitted from said respective relay stations to said one of the base stations.

14. A wireless network control method that controls a radio access network having a plurality of base stations that communicate with a mobile terminal, and relay stations provided in association with the respective base stations to relay communication between the mobile terminal and the base station, comprising:

a mobile-terminal detection step where the base station detects a mobile terminal;

a determination step where, when the base station detects



the mobile terminal, whether another base station in communication to the same mobile terminal exist or not is determined based on information obtained from said another base stations;

a search step where, when said another base station in communication with the mobile terminal detected by said base station are determined to exist, a base station that can be communicatively connected to a relay station associated with said base station and relay station associated with said another base station is searched based on a management table, wherein the management table stores information on the relay station associated with said base station and the relay station which is associated with said another base station and can be communicatively connected to said base station;

a control step where a control signal is communicated through inter-base station communication means such that communication connection is established between the base station searched by the search step and the respective relay stations;

and a combining step that performs diversity combining of radio signals from the mobile terminal received through a plurality of relay stations.